ABSTRACTS (MASTER THESIS)

Evaluation of trail-following and attracting activities of some chemicals against the dry-wood termite *Incisitermes minor*（Hagen)

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1. Introduction

Information on termite's response toward chemicals such as trail pheromones and attractants could be valuable as a lure or bait for their control. However, this information is still limited simply to subterranean termites. The lack of information on chemical behavior of dry-wood termites is partially due to their feeding behavior: a single piece feeder. In this study, workers of the dry-wood termite, *Incisitermes minor* (Hagen) were investigated for their response to a trail pheromone candidate and several other possible attractants by trail-following and Y maze odor bioassays in combination with analysis of semiochemicals from alive termite and body extract.

2. Materials and Methods

Only workers were used in the bioassays. Chemicals used were a trail pheromone candidate (*Z*)-3-dodecenol, and possible attractants 2-phenoxyethanol, *d*-camphor, and maple lactone. The circular open-field bioassay was conducted with a Ø 12.5-cm filter paper. The termite was allowed to walk in Ø 7-cm pencil line (n=20). Parameters observed were number of individual with positive response (termite walk continuously in 3-cm line), distance travelled and walking speed. In the odor bioassay, a Y plastic maze (5-cm in both stem and branch length) was placed on a Ø 15-cm filter paper, and termite was allowed to choose between the chemicals and control (n=20). For semiochemical identification the body extracts of 60 workers were obtained by soaking into 600 µl hexane for 18 hours in room temperature. In the head space sampling, sixty workers were put into Monotrap (MT) kit and exposed to the absorbent MT RCC18 for 24 hours. The absorbent was then dipped into 70µl hexane, and sonicated for two minutes. All hexane samples were analyzed with a 5973N Mass Selective detector coupled to a 6890 Gas Chromatograph (Agilent Technologies, Palo Alto, CA).

3. Results and Discussion

In the trail-following bioassay, (*Z*)-3-dodecenol showed significantly positive responses for all concentrations in comparison with those of the control, but no significant response was observed in the odor bioassay. This finding confirms the previous report, indicating (*Z*)-3-dodecenol as a main component of trail pheromone from seven dry-wood termite species. In the attractant series, *d*-camphor showed the significant results both in the number of response and distance travelled for the circular open-field bioassay. Only 2-phenoxyethanol showed the significant result in number of positive individuals in the odor bioassay. This chemical has been reported as a trail-following mimic and attractant to subterranean termites. Dodecanol was identified from the *I. minor* body extract. The chemical was also reported in the dry-wood termite *Kalotermes flavicollis*. (*Z*)-3-dodecenol was not found in the present analysis probably due to different methods extraction. Nonanal and 2-nonanone were identified from the head space sample for the first time from termites.